



Better Training for Safer Food *Initiative*

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Biosecurity During Outbreak Management

BTSEF

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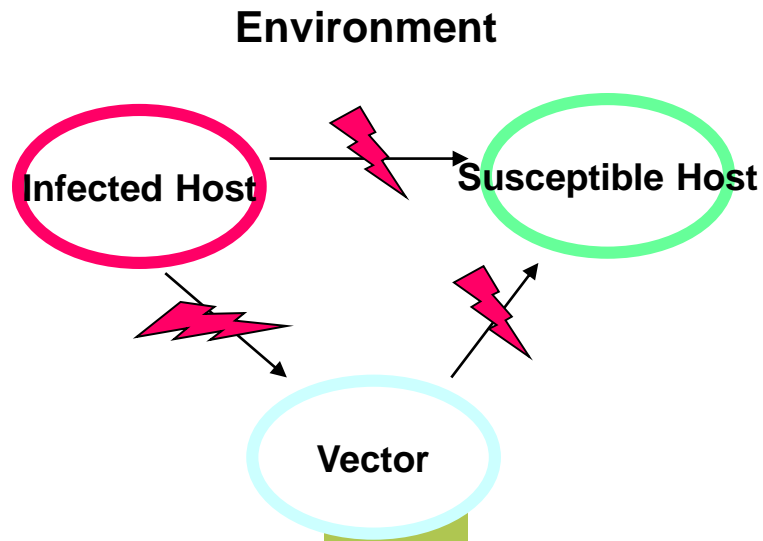
SUMMARY

- *Biosecurity*
 - ✓ **Farm level**
 - ✓ **Within the framework of disease control**
- *Risk factors involved in the spread of African swine fever*
- *Biosecurity in the backyard system*

BIOSECURITY (1)

Definition:

*“The implementation of measures that reduce the risk **(1)** of the introduction and **(2)** spread of disease agents; it requires the adoption of a set of attitudes and behaviours by people to reduce risk in all activities involving domestic, captive/exotic and wild animals and their products”*
(FAO/OIE/World Bank, 2008 – Good Practices for Biosecurity in the Pig Sector)



BIOSECURITY (2)

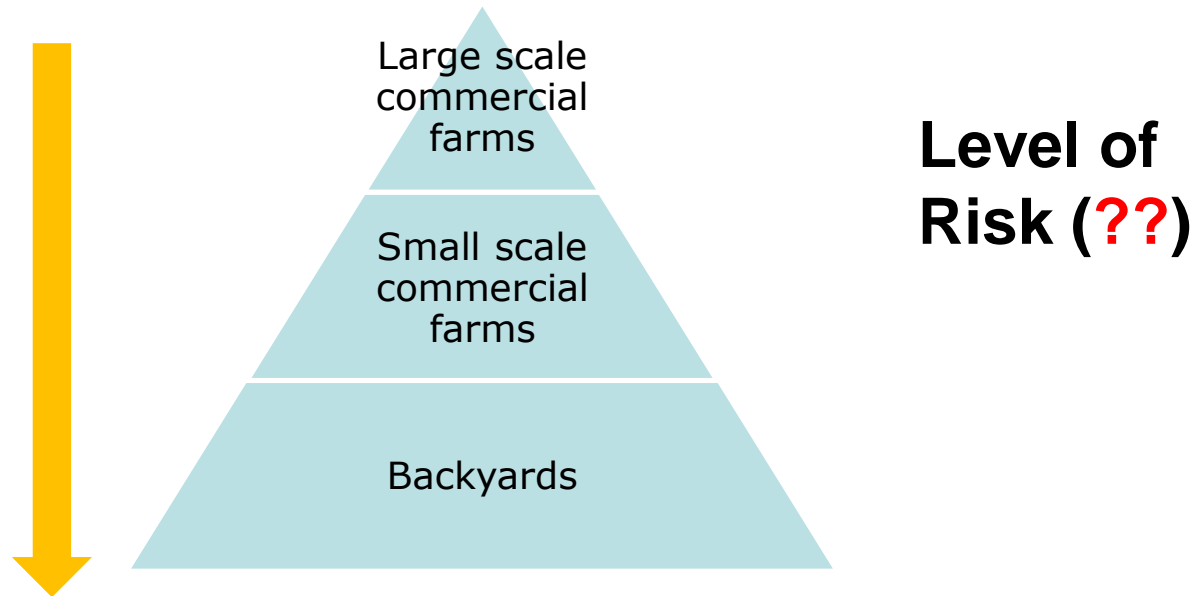
External: measures to adopt to mitigate the risk of introducing a disease in a holding. Measures +/- strict in accordance with:

Type of production, health status required, epidemiological situation.

Internal: measures to adopt to mitigate the spread between different groups of animals, different categories, different units, depends on:

- **The health status of the holding, structure of the holding, possible margin of improvement on the basis of economic resources available**

Bio-Security Levels



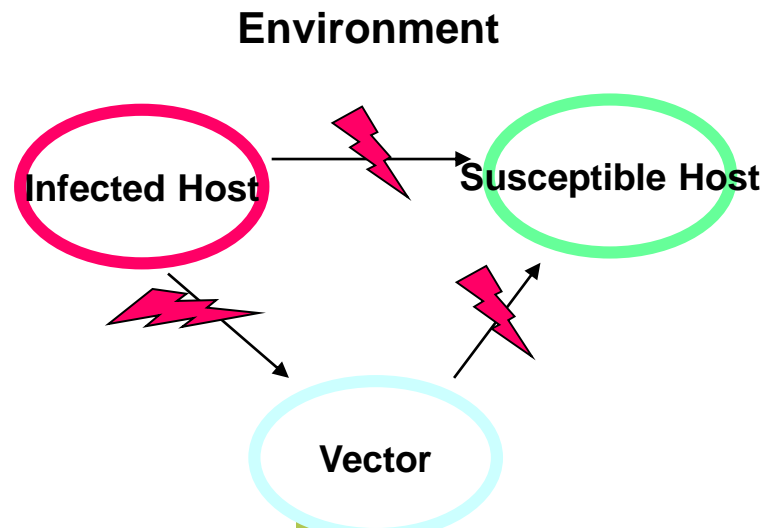
BIOSECURITY (3)

Also a key element for the control of diseases:

- **PREVENTION:**
 - **Direct: biosecurity**
 - **Indirect: ... (VACCINATION)**
- *EARLY DETECTION (surveillance)*
- *EARLY REACTION (eradication)*

To contain successfully the spread of a disease

1. To know the disease and its spreading pathways
2. Strict implementation of the disease control measures adopted to minimize the risk of spreading



Factors affecting the spreading pathways of a disease:

- ✓ **Characteristics of the host(s):**
susceptibility and contagiousness
- ✓ **Characteristics of the pathogen:**
infectivity, virulence and stability
- ✓ **Effectiveness of the contact**



**Strongly Dependent on Population
Density**

Main Risk Factors for diseases introduction and spread:

- ✓ Introduction of animals into the holding
- ✓ Introduction of vehicles/means of transport:
 - Animals
 - Runts,...rejected pigs
 - Carcasses
 - Feed
- ✓ Personnel, veterinarians, inseminators and visitors
- ✓ Introduction of equipments
- ✓ Introduction of feed
- ✓ Area: use of common area / pasture (use of manure on agricultural land as fertilizer)
- ✓ Presence of wildlife animals
- ✓ Presence of rodents, birds, insects..
- ✓ Introduction of semen
- ✓ Vaccine, water, air...

Population Density



Potential Risk for Introduction/Spread of a disease

Sparsely Populated Livestock Areas (SPLAs):
low risk area, local potential risk < 1 , it does not allow the spread of the disease.

Densely Populated Livestock Areas (DPLAs):
high risk area, local potential spread > 1 , population density by itself allows the spread of the disease

To address the farm biosecurity protocol it is necessary to know:

The Holding

Size (?)
Type of production
Management
Infrastructure/limits
Health Status

The Area

Location
Animal density
Health Status

The Situation

- **peace time**
- ***emergency***

To Identify the Risks

To Apply Proper Control Measures

..and the proper SURVEILLANCE

Main Elements of Biosecurity

Segregation:

- ✓ Controlling the entrance of pigs: from outside farms, markets or villages;
- ✓ implementing quarantine for newly purchased animals;
- ✓ limiting the number of sources of replacement stocks;
- ✓ fencing a farm area and controlling access for people, as well as wildlife, birds, bats, rodents, cats and dogs;
- ✓ maintaining adequate distances between farms;
- ✓ providing footwear and clothing to be worn only on the farm;
- ✓ using an all-in-all-out management system.

Cleaning and Disinfection

- ✓ buildings on the premises, but also vehicles, equipment, clothing and footwear
- ✓ **Disinfectants**



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Risk Factors



Biosecurity

in practice is implemented through:

Physical protection measures:

- Enclosing, fencing, roofing, netting
- Cleaning, disinfection and control of insect and rodents

Management measures:

- Procedures for entering and exiting the establishment for animals, products, vehicles and persons
- Procedures for using equipment
- Conditions for movement based on risk involved
- Conditions for introducing animals or products into the establishment
- Quarantine, isolation or separation of newly introduced or sick animals
- A system for safe disposal of dead animals and other animal by-products.



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Entrance

YES





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Entrance

NO



Biosecurity at farm level

EXTERNAL BIOSECURITY

- Isolation (barriers, fences, gate, signs..)
- Quarantine
- Area for the disinfection of vehicles (Equipment, disinfectants)
- Loading/Unloading area
- Movements management (animals, vehicles, waste, carcasses, feed)
- C&D: people, vehicles, equipment
- Recording of the movements: animals, people, vehicles
- Buying-in Policy
- Partnership
- Training

INTERNAL BIOSECURITY

- Isolation of animals
- Grouping of animals: age, health status..
- **Removal of dead animals**
- Manure
- Vaccination (I/E)
- Feeding
- Procedures for internal control: feed, water..
- Recording: animal testings, diseases, treatments, productions..
- C&D
- Rodents control
- Training

Container for dead pigs

NO



Buying-in Policy

- Careful evaluation of the health status of the supplier(s)
- Low number of supplier(s)
- Transport management
- C&D loading/unloading area
- Quarantine

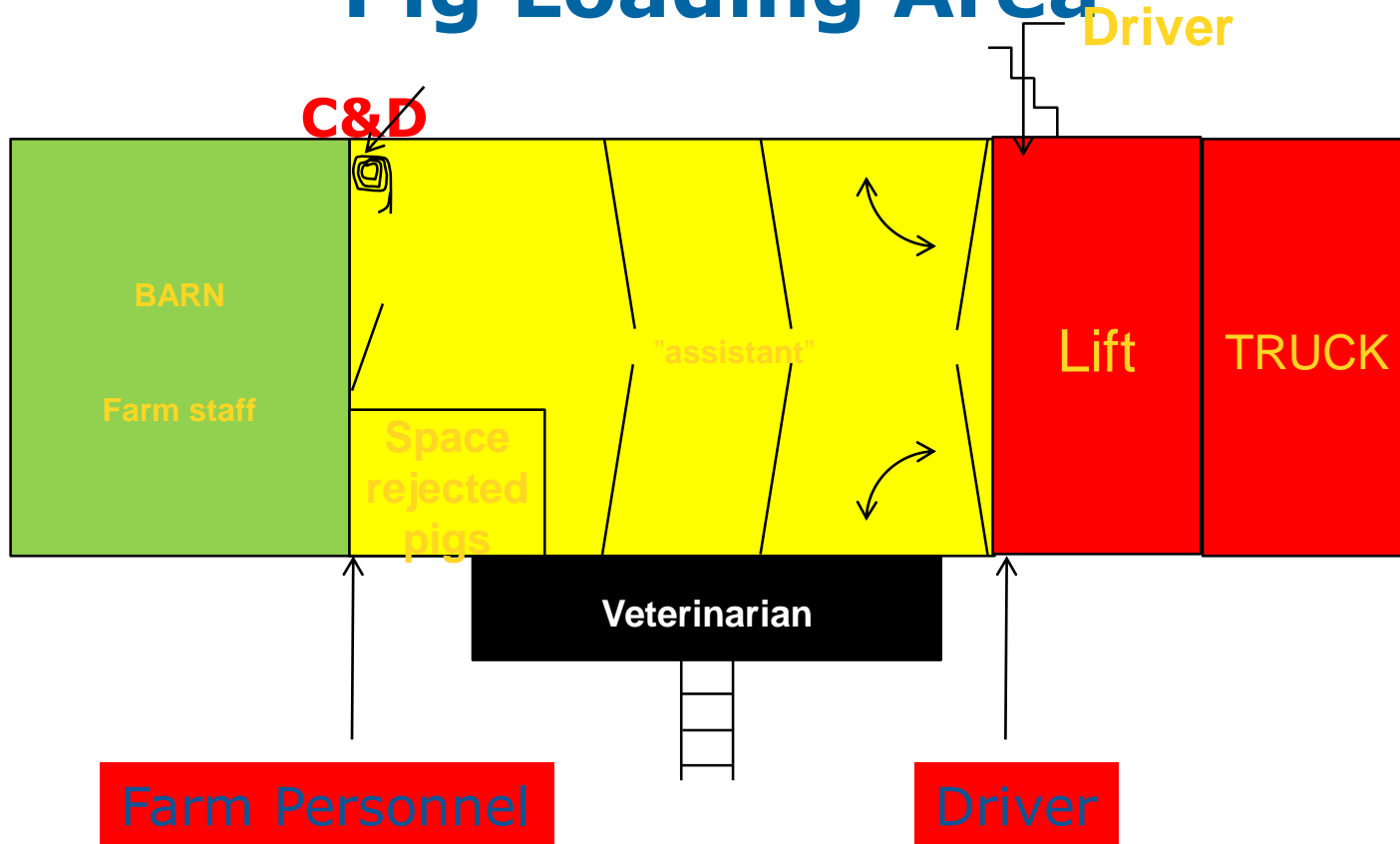
Quarantine

- 30 days
- Animals in quarantine or physically isolated from the rest of the herd
- Frequency limited
- Animals frequently checked to early detect the presence of ASF
- Passive surveillance, supplemented when necessary by lab testing



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Pig Loading Area



Loading Area

NO





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Loading Area

YES



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Ramp and Gate

YES



To contain successfully the spread of a disease

- To know the disease and its spreading pathways
- Strict implementation of the disease control measures adopted to minimize the risk of spreading



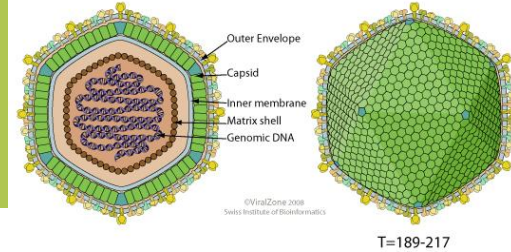
The ASFV: large enveloped DNA virus genus *Asfivirus*, family *Asfviridae*, one serotype but 16 genotypes and different strains of different virulence.

The virus is very stable, and survive in excretion, carcasses, pig meat, pig meat products...

African Swine Fever:

Spreading Potential:

- Very long viremic period
- ASFV is resistant in the environment
- A range of wild and domestic pigs species are susceptible
- ASFV can remain infectious for 3–6 months in uncooked pork products
 - **Chilled meat: at least 15 weeks**
 - **Frozen meat: ..years**
 - **3 to 6 months in hams and sausages**
- Sometimes soft ticks of the genus *Ornithodoros* act as biological vector within the vector: trans-stadial, trans-ovarial, and sexual transmission occur



ASFV: resistance to physical and chemical action

Temperature: Highly resistant to low temperatures. Heat inactivated by $56^{\circ}\text{C}/70$ minutes; $60^{\circ}\text{C}/20$ minutes.

pH: Inactivated by $\text{pH} < 3.9$ or > 11.5 in serum-free medium. Serum increases the resistance of the virus, e.g. at $\text{pH} 13.4$ – resistance lasts up to 21 hours without serum, and 7 days with serum.

Chemicals/Disinfectants: Susceptible to ether and chloroform. Inactivated by 8/1000 sodium hydroxide (30 minutes), hypochlorites – 2.3% chlorine (30 minutes), 3/1000 formalin (30 minutes), 3% ortho-phenylphenol (30 minutes) and iodine compounds.

Survival: Remains *viable for long periods in blood, faeces and tissues*; especially infected, uncooked or undercooked pork products. Can multiply in vectors (*Ornithodoros* sp.).

Possible risk factors for ASF spread

- Introduction of infected pigs in the herd
- Swill feeding with contaminated pork (spread and maintenance)
- Wild boar – Domestic pigs interface
- Contaminated vehicles, people or feed
- Infected ticks (*Ornithodoros* genus)

Scientific Opinion on African swine fever (*EFSA Journal 2014;12(4):3628*)

Table 1: Main sources and routes of transmission established during the outbreaks of ASF in domestic pigs in years 2008-2012

Source and transmission of virus	Number	%
Selling infected pigs	1	0,3
Neighbourhood (infected pigs in backyards)	5	1,7
Direct contact with humans (having a meal right at the farm)	1	0,3
Contact during transportation, shipping, movement	108	38
ASFV infected wild boar	4	1,4
Swill feeding	100	35
Not established	65	23
Total:	284	100

Source: Belyanin, 2013

Preventive Measures to be applied in pig holdings of the Infected Area and in the Infected Area

- Pigs: standstill and movement control (under official control, census, biosecurity to avoid contacts with wild boar, SURVEILLANCE)
- Live pigs markets: when ASF suspected under control (**surveillance**), closed when confirmed
- Carcasses disposal: all animals (DP, WB) tested and properly disposed (category I, Regulation 1069/2009)
- Swill feeding (prohibition should be ensured, system for gathering waste..)
- Home slaughtering only under veterinary supervision
- Biosecurity (animals, personnel, vehicles, fence, feed, carcasses disposal, equipment..)
- Tick control
- **Awareness campaign (Owners, Vets, Hunters...)**



Biosecurity in Backyards

(minimum requirements)

- No contact between the pig(s) of the NCF and susceptible animals (indoor keeping)
- **No swill feeding** / [Treatment (T°: 70°x 30m = negligible risk)]
- No contact to any part of feral pig (hunted or dead wild boar/meat/by-products)
- Unauthorized persons are not allowed to enter the pig holding (stable)
- The owner / person in charge of the pigs, should change clothes on entering the stable and leaving the stable having disinfection at the entrance of holding (stable)
- Presence of effective disinfectants



Measures to minimize the risk of ASF introduction into a pig holding:

- Pigs should be introduced from trusted and certified sources,
- Visitors should be discouraged to enter the pig holdings, specially the commercial ones,
- Personnel should be well trained/informed and contacts with other pigs forbidden,
- Perimeter fencing preventing contact with feral pigs (double fences) should be install on a pig holding,
- Carcasses, discarded parts from slaughtered pigs and food waste should be disposed of in an appropriate manner,
- Mannure
- No part of any feral pig, whether shot or found dead should be brought into a pig holding,
- No swill feeding
- Sharing of equipment between the holdings should be avoided,
- Appropriate means for cleaning and disinfection have to be placed at the entrance of the holdings.
- Vehicles and equipment should be properly cleaned and disinfected before entering into contact with pigs; however they should not enter the holding,
- Appropriate hygiene measures have to be applied by all persons entering into contact with pigs (domestic and/or feral).



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